



U1901A GS-8800 Series (PXT) Wireless Communication Design Verification (DV) and Conformance Test (CT) System

Data Sheet



U1901A Design and Verification Test System

The Agilent U1901A is the latest addition to the GS-8800 design verification (DV) and conformance test (CT) test system family. The U1901A uses Agilent's latest one box tester, the E6621A PXT wireless communication test set, as a core signaling unit. This automated and calibrated platform provides coverage for LTE test cases from Section 6 to Section 9 of the TS 36.521-1 LTE test standards and is designed for engineers who need to perform more in-depth verification or conformance testing of their LTE devices.



Agilent Technologies

U1901A Platform Overview

The U1901A is designed for RF chipset module or mobile user equipment (UE) testing in applications areas including

- R&D test application
- Early-design phase test requiring high flexibility to configure test parameters
- Stress test
- Device qualification
- Device conformance test

The U1901A DV environment allows test cases to be easily configured or modified to suit specific test requirements.

The CT environment has all the specifications and parameters configured as per the 3GPP specification. The U1901A CT system is listed in Global Certification Forum (GCF) and PCS Type Certification Review Board (PTCRB) as Test Platform 101 (TP101).

U1901A Platform Characteristics

The U1901A is an integrated dual- or three-bay rack consisting of the E6621A PXT wireless test set, the N9020A MXA signal analyzer, and signal generators for adjacent channel simulation, along with switching and band filtering RF modules. Since the U1901A is a common platform for both DV and CT, it provides a flexible, scalable solution simply through the upgrading software licenses. Test cases are enabled through optional software licenses for DV or CT.

The DV system provides test coverage that helps to ensure desired results before a new chipset or wireless handset goes into full conformance testing at the test house using the U1901A CT application.

Using the DV system helps increase end user confidence. In addition to ensuring that designs pass the first time through complete conformance testing, it indirectly reduces or prevents the cost of re-design and re-validation. Additionally, it helps minimize the end user's product time to market.

The U1901A DV and CT systems are designed in accordance to 3GPP specification TS 36.521-1 test cases which covers transmitter (Section 6), receiver (Section 7), performance (Section 8)¹, and reporting of channel state information (Section 9)¹ test cases. Agilent is dedicated to supporting more test case sections and enhancing test coverage as technology standards evolve.

The unique system architecture of U1901A makes it easy to modify the system configuration. From R&D to manufacturing and quality assurance screening applications, users can scale the system to get all the test capabilities needed.

1. Future release.

Flexibility

The U1901A support bands that are approved by GCF/PTCRB as well as other bands defined in the 3GPP specification.

Band supported ^{1, 2}	
Band 1	Nominal
Band 2	Nominal
Band 3	Nominal
Band 4	Nominal
Band 5	Nominal
Band 6	Nominal
Band 7	Supported
Band 8	Nominal
Band 9	Nominal
Band 10	Nominal
Band 11	Nominal
Band 12	Nominal
Band 13	Supported
Band 14	Nominal
Band 17	Supported

In addition, the flexible measurement software provides users the ability to change the station configuration to switch between design verification and conformance testing based on test measurement users need to perform.

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1. *Nominal means the associated band class hardware is available but not completely tested with UEs. More bands will be supported in future for both DV and CT systems.*
 2. *Please refer to GCF, <http://www.globalcertificationforum.org> and PTCRB, <http://www.ptcrb.com> for latest validated test cases and band classes.*

Scalability and upgradability

U1901A is designed as a common platform for both design verification and conformance testing, therefore it provides a clear upgrade path which enables the design verification system to be scaled up to a conformance test system by just upgrading software licenses.

U1901A can also be leveraged from the N1960A GS-8800 family model by reusing the PXT, MXA, filter boxes, and software license that support LTE test cases.

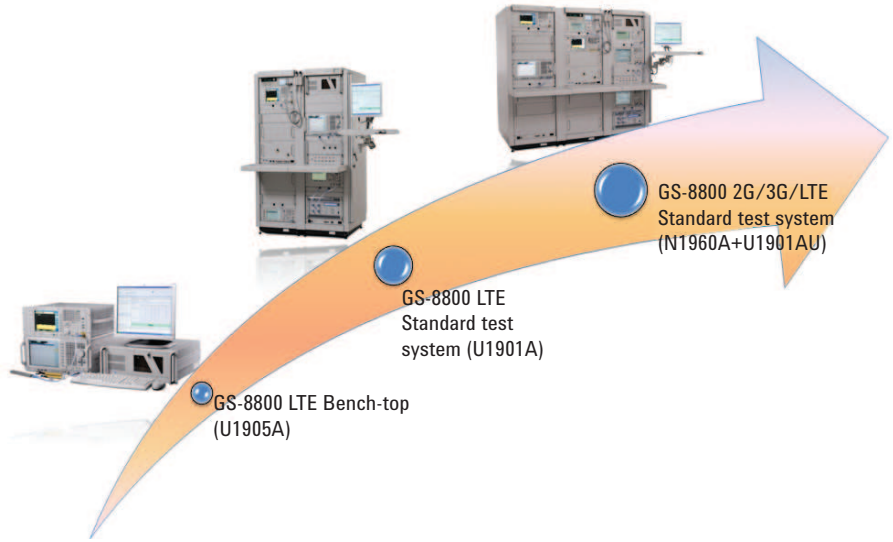


Figure 2. GS-8800 LTE scalability and upgrade path

Accuracy and repeatability

Routine, annual, signal path calibrations check the signal loss of the entire system path and automatically compensates for loss during test case measurement to provide accurate and repeatable results.

U1901A also leverages the measurement speed, accuracy, and repeatability strengths of Agilent products; creating reliable, high performance design verification and conformance test systems.

Measurement uncertainty

System uncertainty can arise from sources including stability of instrument, linearity of instrument, mismatch between DUT and the test system, and the repeatability of the RF interface box switching. The U1901A system is designed in accordance to the measurement uncertainties as required by the 3GPP standard.

Comprehensive test coverage

U1901A supports comprehensive test coverage and Agilent is dedicated to supporting more test sections, such as Section 8 and Section 9, and enhancing test case coverage as technology standards evolve.

Please contact Agilent sales for detail test case coverage and visit GCF, <http://www.globalcertificationforum.org> and PTCRB, <http://www.ptcrb.com> for GS-8800 U1901A LTE system (TP 101) validated test cases.

Dedicated software and technical support

U1901A's software and technical support contract (STSC) entitles users to software updates and feature enhancements, as well as direct access to a technical expert for technical support for the period of the STSC contract. The purchase of a minimum of 1 year STSC is required for new system purchases, and extended term STSC coverage is available. For more info on STSC, please visit www.agilent.com/find/gs8800.

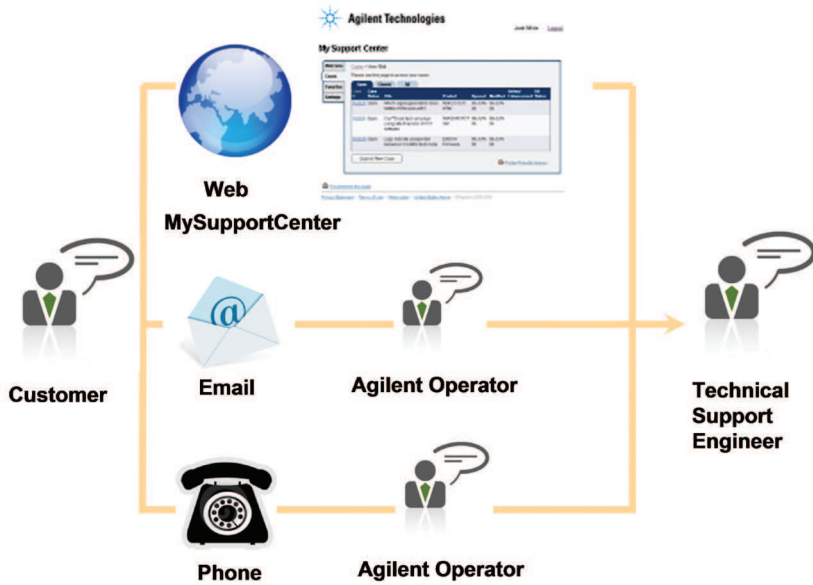


Figure 3. Contact methods for technical support

Software Architecture

The U1901A's GS-8800 LTE measurement software is design using Microsoft® .NET. The modular-based software architecture allows for easy software maintenance, support, and patches installation.

The software architecture is design with flexible sequencing capability in mind to reduce test times. In addition, it also affords users the flexibility to switch between DV and CT testing modes. The ability to plug-and-play different .dll files allows user to customize the system by leveraging measurement files used by other Agilent instruments.

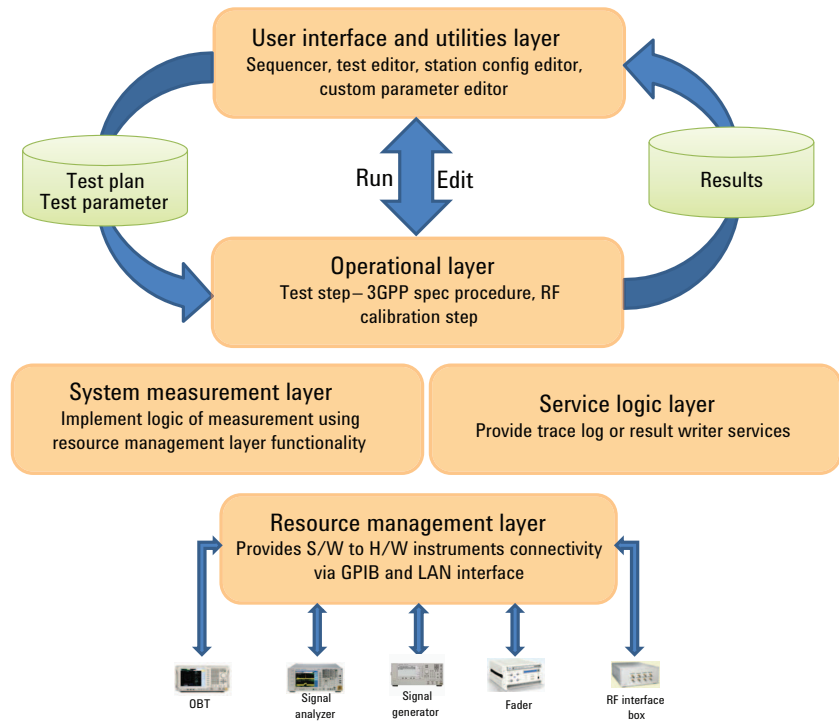


Figure 4. GS-8800 LTE system architecture

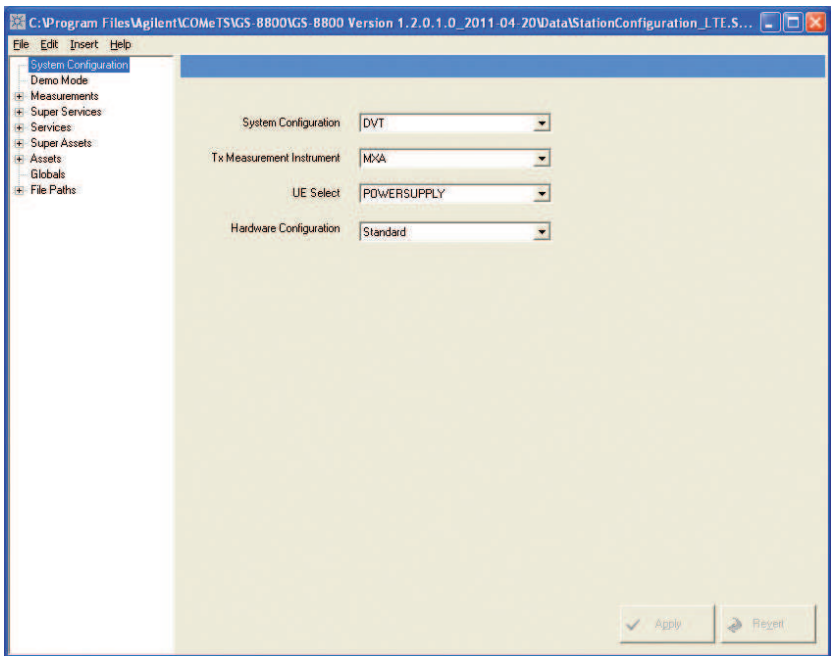


Figure 5. GS-8800 LTE system configuration tool

The architecture provides a foundation that allows end user to incorporate their own value-added test components, such as temperature chamber control or the UUT control component.

The GS-8800 LTE measurement software GUI provides a structured means to automatically execute a series of test cases, supplied as a test campaign. The test campaign combines collections of individual test cases into a test plan, each designed to evaluate the UE's RF parametric tests, per the TS 36.521-1 specification. Any combination of test cases can be saved and recalled as test plan, allowing the test plan to be quickly set up and executed.

Detailed results and test environment variables of a particular test case can be easily identified during run time through "Detail results" and "Watch" screens, without have to wait for a complete test result at the end of the test campaign.

The U1901A's flexible GUI allows users to tailor the screen to personal preferences using a simple drag-and-drop process. The online documentation (.chm) is linked with the GUI to allow users to quickly access the help information relevant to the screen being viewed.

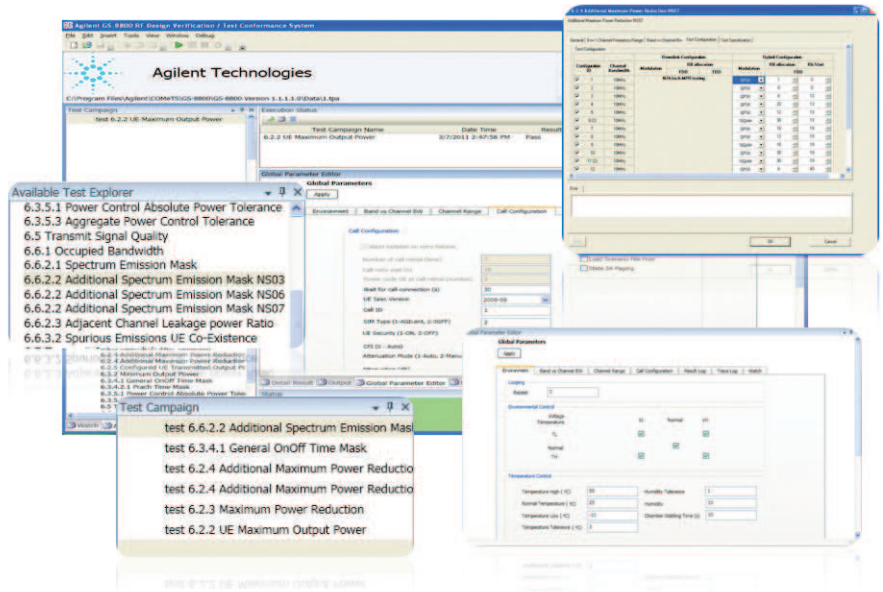


Figure 6. GS-8800 LTE measurement software component

The calibration tool enables users to identify all signal paths loss, which is used by the system to correct signal loss during test case measurement.

The software also provides integrated data collection. Results reporting, saved in a comma-separated value (.csv) format and Markup Language (XML), allows data to be easily used by other applications or customer-specific software tools.

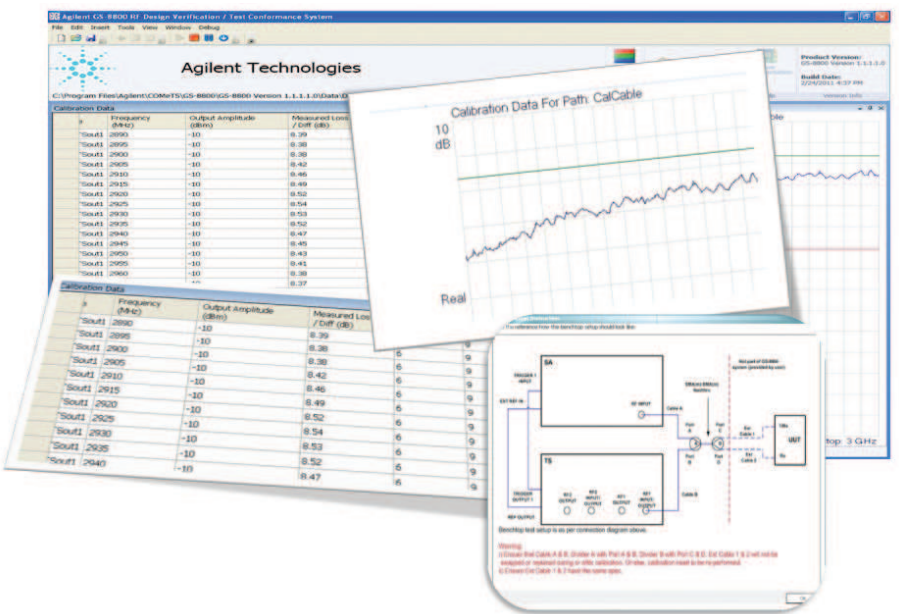


Figure 7. GS-8800 LTE calibration tool

Specifications

General instrument specifications	
E6621A general specification	
RF input/output impedance	50 Ω (nominal)
RF input/output VSWR	< 2.0:1
Maximum safe input level	+27 dBm
Interfaces	USB, LAN, GPIB (future), trigger in/out, IQ/IF inputs/outputs, reference input/output
RF reference input/output	10 MHz
Frequency reference accuracy	$\pm 1\text{E-}6$
Aging per year	5x10E-8 (-20 to 70 °C)
Temperature stability	2x10E-8
Power requirement	100 to 240 VAC, 50/60 Hz
Size (w x d x h)	444 x 600 x 222 mm (17.5 x 23.6 x 8.7 in)
Weight	27.6 kg (60.8 lb) maximum with all possible options
N9020A general specification	
Voltage and frequency (nominal)	100 to 120 V, 50/60/400 Hz 220 to 240 V, 50/60 Hz
Weight (without options)	16 kg (35 lb) nominal
Size (w x d x h)	426 x 368 x 177 mm (16.8 x 14.5 x 7.0 in)
Interfaces	USB, LAN, GPIB, trigger in/out, reference input/output
E8257D general specification	
Voltage and frequency (nominal)	100/120 VAC, 50/60/400 Hz; or 220/240 VAC, 50/60 Hz, (automatically selected); < 250 W typical, 450 W maximum
Weight (without options)	< 22 kg (< 48 lb) net, < 30 kg (< 68 lb) shipping
Size (w x d x h)	426 x 515 x 178 mm (16.8 x 20.3 x 7.0 in)
Interfaces	LAN, GPIB, trigger in/out, reference input/output
E4438C general specification	
Voltage and frequency (nominal)	90 to 254 V; 50/60/400 Hz nominal; 200 W maximum
Weight (without options)	< 16 kg (< 35 lb) net, < 23 kg (< 50 lb) shipping
Size (w x d x h)	426 x 432 x 133 mm (16.8 x 17.0 x 5.2 in)
Interfaces	GPIB, trigger in/out, data in/out
PC/peripheral input/output	
USB	Six auxiliary ports are available: two on the front panel and four on the rear panel of the industrial PC
Serial (RS-232)	Two on the on the rear panel of the industrial PC, DB9 male connector
LAN	Three 100 Base-T Ethernet, RJ-45 connector
GPIB	One on the rear panel of the industrial PC

Specifications *Continued*

General specifications	
Operating conditions	
General	Indoor
Storage temperature	-20 to +70 °C (-4 to 158 °F)
Operating temperature	+10 to +30 °C (50 to 86 °F)
Accuracy specified temperature	+20 to +30 °C (68 to 86 °F) (Refer to measurement accuracy specification of individual radio technology for further information)
Humidity (relative)	5 to 80% relative humidity (non-condensing)
Altitude	0 to 2 km (0 to 1.2 miles)
Power requirement	90 to 254 VAC, 50 to 60 Hz, 4118 VA maximum
Rack dimensions	
2.6 m rack (EIA: 32 RU)	2020 x 1200 x 905 mm (79.5 x 47.2 x 35.6 in)
Single/Two racks configuration (h x w x d)	When mounting work surfaces, maximum extra-depth is 500 mm (19.7 in)
Weight	
2.0 m rack x 1 rack	335 kg (739 lb) maximum
2.0 m rack x 2 racks	692 kg (1,525.5 lb) maximum
Recommended system path loss calibration interval	
Nominal	1 year
Exception	System path loss calibration must be performed when any of the following events occur in the related signal path: <ul style="list-style-type: none"> • Any instrument RF interconnect cable is replaced • Any instrument is calibrated • Any instrument is repaired and re-calibrated



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